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[redacted] 25X1

THE WHITE HOUSE
WASHINGTON

July 6, 1965

Dear Bud:

Dr. Land plans to hold the first meeting of his reconnaissance panel on July 21 beginning at 9:00 am in Room 303 of the Executive Office Building. Its purpose is to review the general requirements, the operational programs and new plans and concepts for overflight reconnaissance. Dr. McMillan has been requested to discuss the national reconnaissance programs and plans along the lines of the attached agenda and we will appreciate your assistance by providing discussions on those topics of particular interest to you as indicated on the agenda. The Panel would like to hear from contractors in the briefings as much as practicable, and in particular, it wishes to have contractor presentations for that portion of the agenda dealing with high resolution search concepts. I would appreciate your instructing [redacted] accordingly. 25X1 NRO

Dr. Land plans to conduct agenda items 1 and 4 as round table discussions. He has asked Richard M. Bissell to make some introductory remarks on general requirements and has invited the Director of Central Intelligence to give his views on these items.

Please let me know if I can be of assistance to you in preparation for this meeting.

Sincerely,

[redacted] 25X1 NRO

Donald F. Hornig
Special Assistant for
Science and Technology

NRO and USAF review(s) completed.

Dr. Albert D. Wheelon
Deputy Director for
Science and Technology
Central Intelligence Agency
2430 E Street, N. W.
Washington, D. C.

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AGENDA

1. Intelligence requirements as they relate to overflight reconnaissance. A general discussion of requirements as expressed by USIB and as translated into specific objectives for the National Reconnaissance Program, particularly with regard to resolution and coverage, quick response, low vulnerability and to our capabilities for supporting crises management and active war situations.

Panel Chairman 1 hour

2. The National Reconnaissance Program. An outline review of all NRO programs and R/D plans to include photographic, Elint and mapping activities. A brief summary of the mode of operation, capability, and costs of operational systems and a discussion of the capability of present and planned projects to meet intelligence requirements. A discussion of NRO organization for operations and research and development.

Director, NRO 1 hour

3. New concepts of particular panel interest. System description and capability, funding requirements, interaction with present operational programs.

a.

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b. Search Systems

High resolution follow-ons to Corona:

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NRO

	1 hour
Eastman Kodak	30 min.
Itek	30 min.

c. Quick Response Systems

Oxcart	CIA	15 min.
Isinglass	CIA	30 min.

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4. A general discussion of outstanding technical problems, program deficiencies, unsatisfied intelligence requirements.

Panel Chairman 30 min.

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1. BLACK SHIELD Coverage Chart

Charts As Background For Use If Required

25X1 NRO 1. [redacted] Eastman and Hycon Camera Characteristics.

2. Samples of Photography

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BRIEFING
FOR
PSAC LAND PANEL
15 MINUTES

PROGRAM BACKGROUND AND CURRENT OBJECTIVES/REQUIREMENTS

PROBLEMS

Inlet, electronic inlet control et al., debugging aircraft systems and components, equipment reliability and range performance

25X1 [redacted]

Summary status

AIRCRAFT MODIFICATION PROGRAM

Objective to standardize latest configuration to improve range, reliability, structural strength, [redacted] 25X1

25X1 [redacted] and increase mission duration capability.

BLACK SHIELD

Plan, intended operational coverage, expected performance and status

Cameras

25X1 [redacted]

SUMMARY FUTURE OBJECTIVES

Validate BLACK SHIELD aircraft and systems performance and reliability
aircraft and
Optomize/systems performance and range

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OXCART PSAC LAND PANEL BRIEFING
NOTES

1. PROGRAM BACKGROUND AND CURRENT OBJECTIVES/REQUIREMENTS:

OXCART was started in 1959 as a successor to the U-2 and contractor go-ahead given in February 1960.

System: Mach 3.2 aircraft capable of flying in excess of 80,000 feet with a range of over 4,000 n.m. and incorporating minimum radar cross section features to reduce enemy detection. Sensor equipment: camera with 60 nm swath and 1 ft resolution.

First flight occurred

At present we have a two place trainer aircraft, 2 flight test aircraft operated by Lockheed and 8 operational configured airdraft under Detachment control. Two aircraft have been lost in crashes.

All aircraft have flown more than 1380 flights and 1950 hours.

(A chart on breakdown of significant times will be available)

Current Objective/Requirement: develop a capability to enable deployment of aircraft to Kadena, Okinawa, this fall if needed as a contingency to back-up other collection systems for use against China and SEA.

2. PROBLEMS:

The major problem over the past two years has been to make the aircraft inlet to perform acceptably and reliably. In addition to incorporation of fixes to the inlet, we concurred in Kelly Johnson's recommendation to install a back-up inlet control undergoing test and debugging since We believe that Kelly understands the problem and is on the right track. In addition, we have reached a point where we are getting down to the simple basics of debugging the aircraft systems to give us the reliability needed for oporational use. The trend has been slow but proceeding in the direction of improved reliability and performance. Unfortunately, Kelly's preoccupation with the inlet problems slowed-down a concerted attack on the debugging problems until recently. Range performance optomizing has been slow due to the foregoing problem effort but high on the priority flight test requirement list.

3. DETACHMENT:

25X1

The major aircraft systems, such as the INS, have been performing reasonably well. The two primary camera systems, Perkin-Elmer and Eastman-Kodak, have performed up to expectations. A third camera system a 48' Hycon system, now is undergoing flight test. No unusual problems have been encountered in window temperatures though we have not flown sustained however Mach 3.2 flights. We anticipate no problems.

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The major problem in the Detachment is getting

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aircraft through a modification ~~xx~~ program and in the air for reliability validation flying.

4. AIRCRAFT MODIFICATION PROGRAM

Detachment aircraft are undergoing modifications to standardize configurations intended to improve range, reliability, structrual strength, provide electronic counter measure capability and increase mission duration capability.

(A chart will be available amplifying this)

Following receipt of aircraft from the modification program, the Detachment will perform validation and operational readiness confirmation flying and evaluation. Two modified aircraft have been received by the Detachment and two more will be available this month.

5. BLACK SHIELD

25X1 Plan to deploy 3 modified aircraft, [redacted] pilots, people and equipment to Kadena, Okinawa, for sixty day stagings. SAC will support this staging with KC-135 tankers and the Air Force with airlift and facilities et al. This movement of aircraft, people 25X1
25X1 and equipment [redacted] will result in an inability to perform simultaneously Cuban (SKYLARK) missions [redacted] If a permanent staging to Kadena occurs or a SKYLARK capability is required simultaneously, we must get more people and [redacted] 25X1

(Display Black Shield Coverage Map Chart)

This range noted and operational planning is based on conservative minimum demonstrated capability performance of the aircraft. (Optimization of range and performance is still underway and being pursued by the two flight test aircraft under Lockheed direction and control.)

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6.

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7. SUMMARY FUTURE OBJECTIVES

We now are deeply involved in operational planning and aircraft performance and reliability validation program of Detachment operational aircraft to meet a BLACK SHIELD or similar requirement this year.

The flight test aircraft program, under Kelly Johnson, is to be continuously involved in optomizing systems performance and range improvements through increasing longer range flights in addition to work in direct support of BLACK SHIELD aircraft validation and problem areas.

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OXCART STATUS

Assets: 11 Aircraft Total

8 Assigned Operational - 6 In Modification
2 Post Mod Test Flight

2 Assigned Flight Test - 2 Flying

1 Trainer - 1 Flying

Experience: Summary

A.

Total Flights	Total Hours	Max. Alt.	Mach 2.0	Mach 2.6	Mach 2.8	Mach 3.0	Mach 3.2
1378	1945:25	85,700	393:00	172:05	108:19	40:25	8:02

B. 10 Significant Flights

Aircraft	Flight	Date	Max. Alt.	Mach 2.0	Mach 2.6	Mach 2.8	Mach 3.0	Mach 3.2
125	141	17 June	82,000	2:15	2:00	1:10	1:00	
	146	30 June	80,500	2:00	1:50	:50	:35	
128	86	5 May	82,000	1:30	1:00	:55	:50	
	91	25 May	83,000	2:00	1:45	1:00	:40	
129	85	27 Jan.	82,000	1:30	1:27		1:15	
	114	4 June	84,000	1:10	1:07	1:05	1:02	1:00
	119	16 June	84,000	:55	:45	:40	:35	:30
	123	25 June	84,000	:50	:40	:37	:33	:30
131	44	27 May	83,500	1:05	:55	:40	:40	
	45	7 June	83,000	1:10	1:05	1:00	:55	

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DEMONSTRATED RELIABILITY

	15 March - 30 April 1965			1 May - 25 June 1965		
	No. Flts.	No. Success	% Success	No. Flts.	No. Success	% Success
Total Aircraft:	35	16	46	36	22	61
Subsystems:						
Inlet	33	20	61	35	31	89
Engine	35	33	94	36	35	97
Inertial Navigation	29	28	97	36	34	95
Stability & Control	35	35	100	36	36	100
Hydraulics	35	35	100	36	36	100
Camera I & II	10	10	100	8	8	100
Airframe Interface	29	19	65	36	32	89

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MODIFICATION PROGRAM

Objectives:

1. Improve Range
2. Improve Reliability
3. Structure - strength
4. 25X1 [redacted]
5. Increase Mission Duration Capability

Examples:

1. Lockheed Inlet Control
2. Fuel Management
3. 450 Knot Climb
4. Fuselage Strength
5. 25X1 [redacted]
6. Expendables Capacity

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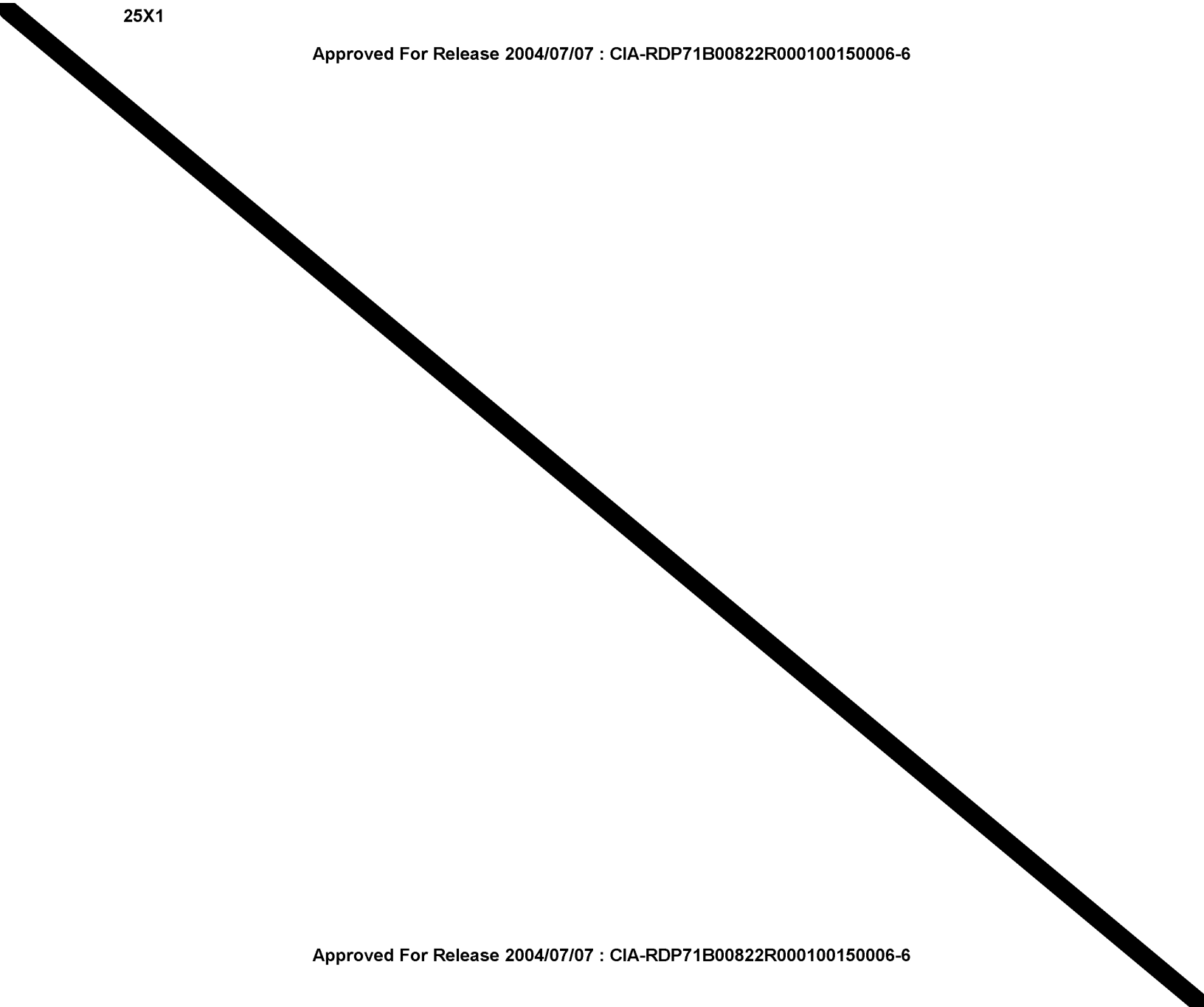

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FLIGHT TEST

Current Effort:

1. Support Operational Commitments
2. Optimize Inlet
3. Optimize Performance
4. Demonstrate Range
5. Evaluate Durability
6. Optimize Engine Power Control

Demonstrated Range: 2580 Nautical Miles @ Mach 3.1, 81,000 Ft. Altitude

Expected Range : 3000-3500 Nautical Miles @ Mach 3.2, 76,000 to 85,000 Ft. Altitude

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SKYLARK CA RA FLIGHT SUMMARY

8 6

0 - Equip. Failure
1 - Successful
2 - Not Attempted
3 - Sat. with Mal. F.

(Chart exists in CL as part of 7/6 NRO Brief)

	P&E TYPE I				E-K TYPE II				Hycon TYPE IV			
	TEST #	DATE	OPERATE TIME	CODE	TEST #	DATE	OPERATE TIME	CODE	TEST #	DATE	OPERATE TIME	CODE
125	100	3/25	17	PT_1	1253	3/16	19	1				
	101	3/30	54	1	128 1254	4/16	75	T_3				
	102	4/14	10	1	128 1255	4/21	70	T_3				
125	103	4/21	70	PT_1	1256	4/23	66	1				
125	104	4/23	47	PT_1	128 1257	4/27	25	T_1				
125	105	5/11	66	PT_1	1258	5/5	56	1	5	5/11	13	1
128	106	5/19	--	PT_2	125 1259	5/18	21	T_1	6	5/25	42	3
	107	5/26	19	1	1260	6/4	77	1	7	5/28	13	0
	108	6/2	65	1					8	6/11	15	1
	109	6/17	50	1					9	6/16	15	3
									10	6/24	35	1

SKYLARK TOTAL 6.6 HRS.
% SUCCESSFUL 100
MAX. SPEED M=3.01
MAX. ALT. 80,000

TOTAL OVER 50 HRS

SKYLARK TOTAL 6.7 HRS.
% SUCCESSFUL 100
MAX. SPEED M=3.15
MAX. ALT. 81,000

TOTAL OVER 15 HRS

SKYLARK TOTAL 2.2 HRS.
% SUCCESSFUL 33
MAX. SPEED 3.10
MAX. ALT. 83,000

TOTAL OVER 3 HRS

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SYSTEM CHARACTERISITCS

TYPE I

Camera System	Panoramic Alternate Imaging
Camera Type	Rotating Mirror Dual Panoramic Slit
Lens	18" f/3.8 Filter #12 Yellow
Window	Double Pane Vacuum 19" x 13" 2 ea.
Lens Film Resolution	200 lines/mm Across Field
Ground Resolution	1' Nadir to 1.6' at 45°
Lens Field Angle	20° Flight Direction
Film	5000' x 6.6" 3404 Emulsion Thin Base
Nominal Weight	600 lbs. Incl. Film
Range	2500 N.M.
Swath Width	60 N.M. 134° (67° + 21° Each Camera)
Exposure Settings	1/50 to 1/660 Variable
Stabilization	3 Axis Gimbal

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SYSTEM CHARACTERISITCS

TYPE II

Camera System	Panoramic Convergent Stereo 60° Coverage
Camera Type	Slit, Swinging Mirror Transverse to Flight Line
Lens	7 Element 21" f/4.0 Refractor Filter #25 Red
Window	22" x 23" x .6 Fused Silica
Lens Film Resolution	130 lines/mm Low Contrast Lens Axis
Ground Resolution	1.3 - 1.6 At Nadir to 2.5' - 3' at 45°
Lens Field Angle	Fore and Aft 20° (Stereo Angle 17°)
Film	2 Rolls 4200' x 8" Thin Base 3404 Emulsion
Nominal Weight	638 lbs. including Film But Not Hatch
Range	3682 N.M. (at 85,000') 2 Hrs. 10 Min.
Swath Width	56 N.M. (at 85,000') 126° (63° + 30° Ea. Camera)
Exposure Settings	1/25, 1/50, 1/100, 1/200, 1/400

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SYSTEM CHARACTERISTICS

TYPE IV

Camera System	Framing 7 Position
Camera Type	Indexing Mirror Focal Plane Shutter
Lens	48" f/5.6 Filter #12, #16, #30
Window	3 Ea. Single Glazing
Lens Film Resolution	80 Lines/mm Low Contrast
Ground Resolution	1 Ft. on Nadir
Lens Field Angle	21°
Film	2 Rolls 9½" x 6000' 3400 or SO 206 Thin Base
Nominal Weight	890 Lbs.
Range	1710 N.M. to 8,550 N.M. Variable Swath
Swath Width	47 N.M. 121°
Exposure Settings	1/40 to 1/1000
Stabilization	Gyro 3 Axis Gimbal

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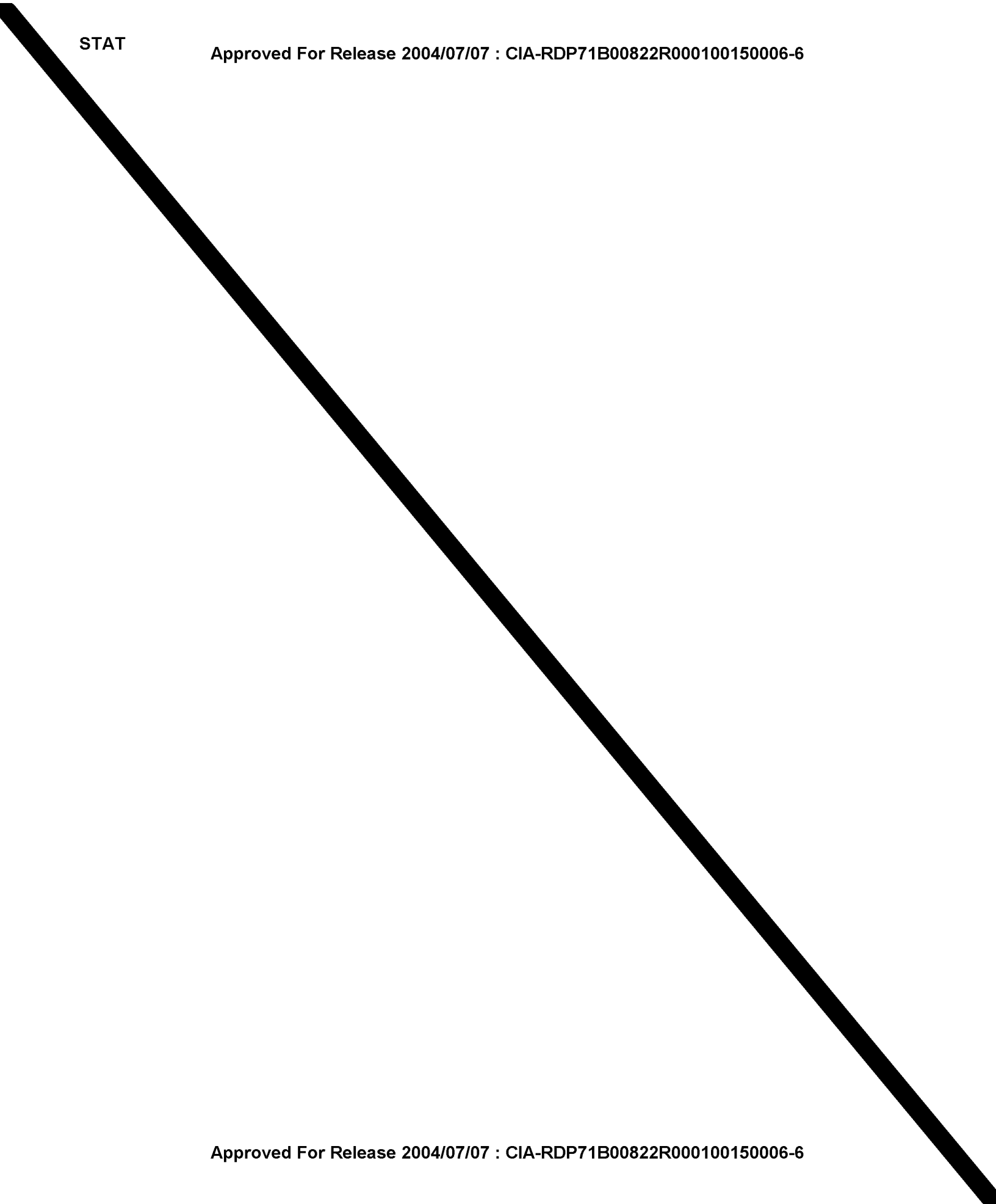

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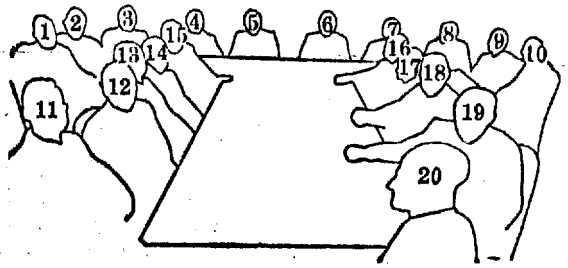
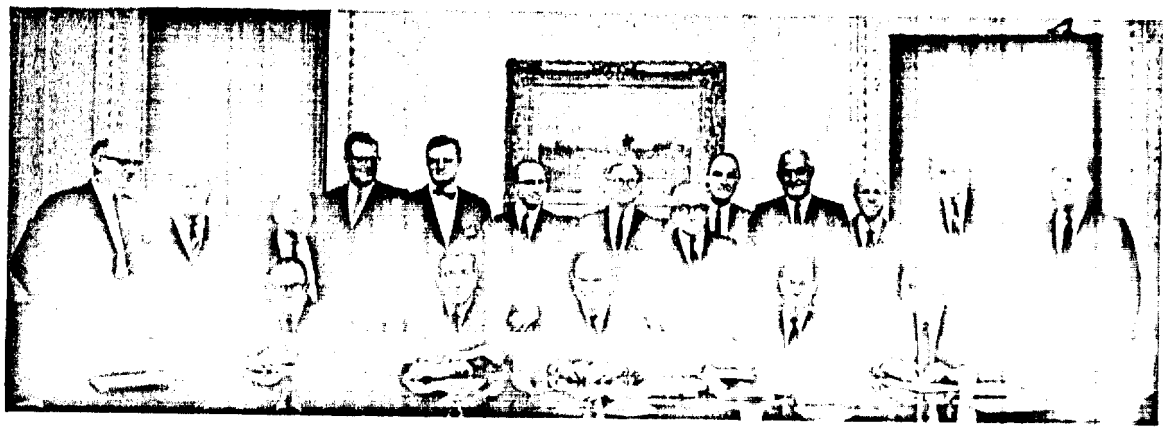
THE PSAC OF 1958



1 Albert Hill, Professor of Physics, MIT. 2 Detlev Bronk, President, Rockefeller Institute. 3 Edwin Land, President, Polaroid. 4 I. I. Rabi, Professor of Physics, Columbia. 5 Robert Bacher, Professor of Physics, CalTech. 6 James Killian, Special Assistant to President Eisenhower for Science & Technology. 7 James Fisk, Executive VP, Bell Labs. 8 Jerome Wiesner, Director, MIT Research Lab of Electronics. 9 Jerrold Zacharias, Professor of Physics, MIT. 10 Caryl Haskins, President, Carnegie Institution. 11 Edward Purcell, Professor of Physics, Harvard. 12 Hugh Dryden, Deputy Administrator, NASA. 13 William Baker, Research VP, Bell Labs. 14 Alan Waterman, Director, National Science Foundation. 15 George Kistiakowsky, Professor of Chemistry, Harvard. 16 Emanuel Piore, Research Director, IBM. 17 James Doolittle, Vice President, Shell Oil. 18 Lloyd Berkner, President, Associated Universities. 19 Herbert York, Chief Scientist, ARPA. 20 Hans Bethe, Professor of Physics, Cornell.



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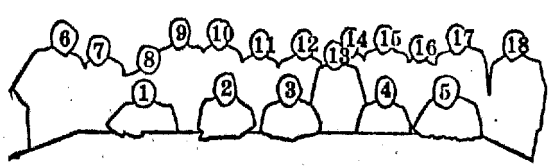

1 John Tukey, Professor of Mathematics, Princeton. 2 Jerome Wiesner, Dean of Science, MIT. 3 Donald Hornig, Director, Office of Science and Technology. 4 Colin MacLead, Deputy Director OST. 5 Jerrold Zacharias, Professor of Physics, MIT. 6 Frederick Seitz, President, National Academy of Sciences. 7 Detlev Bronk, President, Rockefeller Institute. 8 Wolfgang Panofsky, Director, Stanford Linear Accelerator Center. 9 Paul Doty, Professor of Chemistry, Harvard. 10 Harvey Brooks, Dean of Engineering & Applied Physics, Harvard. 11 Richard Garwin, Watson Research Lab, Columbia-IBM. 12 Edwin Gilliland, Professor of Chemical Engineering, MIT. 13 I. I. Rabi, Professor of Physics, Columbia. 14 Franklin Long, Professor of Chemistry, Cornell. 15 William McElroy, Chairman, Department of Biology, Johns Hopkins. 16 Melvin Calvin, Professor of Chemistry, California-Berkeley. 17 George Kistiakowsky, Professor of Chemistry, Harvard. 18 David Beckler, Executive Secretary, PSAC. Members not shown: Philip Handler, Duke. John Pierce, Bell Labs. Edward Purcell, Harvard. Herbert York, California-San Diego.

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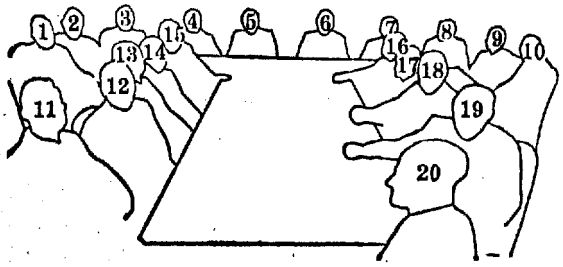

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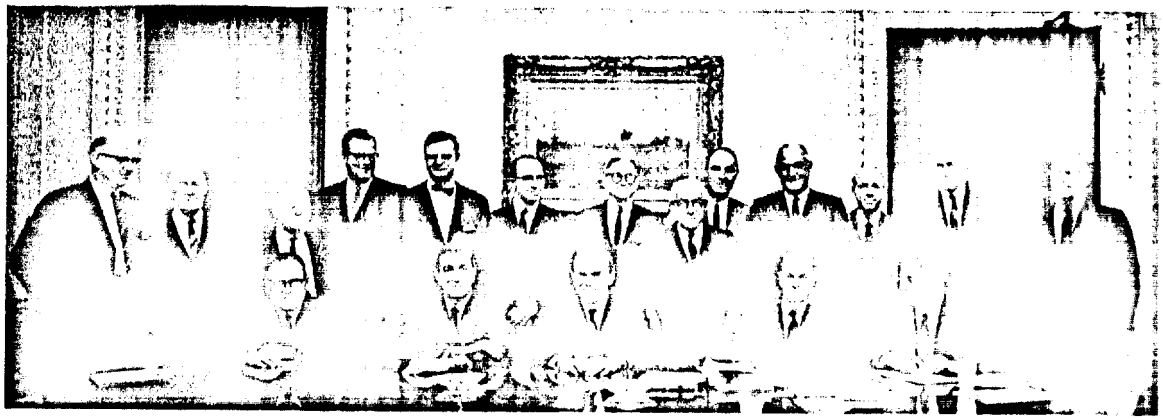

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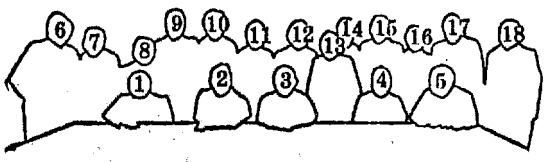

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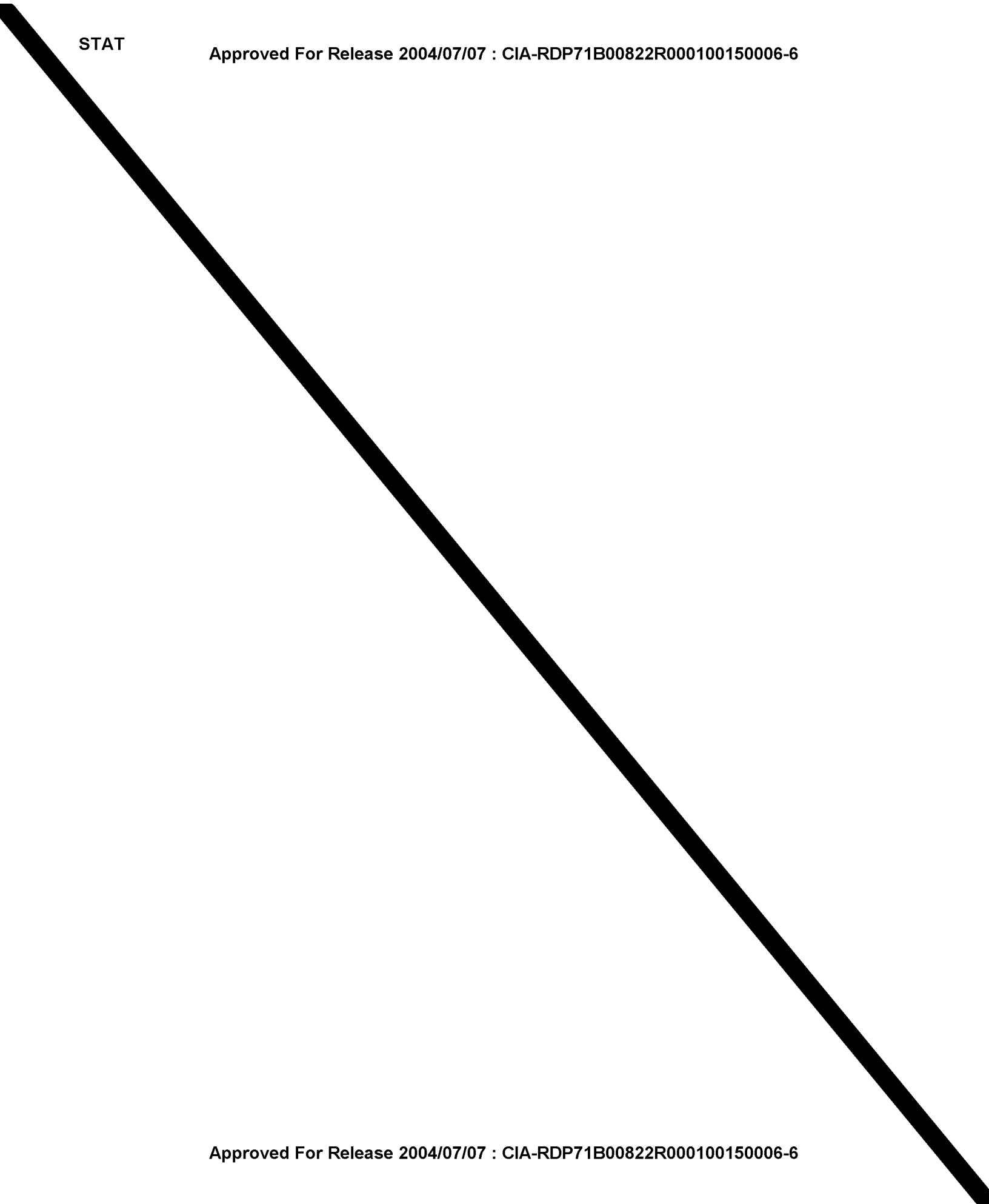

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